

CLAIMS

1. A reinforcing structure for automotive vehicles
wherein a plurality of cross car beams
arranged on the back of the instrument panel in the
5 vehicle are supported by at least a brace erected on the
vehicle floor,

wherein said cross car beams include an
upper cross car beam of a hollow bar having a closed
section suspended between left and right front pillars
10 and a lower cross car beam of a hollow bar having a
closed section bent in the shape of L, and

15 wherein the part of said lower cross car
beam nearer to the driver's seat is in contact with said
upper cross car beam, and the part of said lower cross
car beam not in contact with said upper cross car beam
functions as said brace.

2. A reinforcing structure for automotive vehicles
according to claim 1,

20 wherein another lower cross car beam of a
hollow bar having a closed section bent in the shape of L
similar to the lower cross car beam nearer to the
driver's seat is arranged nearer to the front passenger
seat,

25 wherein a part of said another lower cross
car beam is in contact with said upper cross car beam,
and

30 wherein the part of said another lower
cross car beam not in contact with said upper cross car
beam functions as said brace.

35 3. A reinforcing structure for automotive vehicles
according to claim 1,

wherein the part of said upper cross car
beam and the part of said lower cross car beam in contact
with each other are wholly or partly welded to each other
in axial direction on both sides along the contact line
therebetween.

4. A reinforcing structure for automotive vehicles

according to claim 1,

wherein a brace for supporting said upper cross car beam is arranged on the part of the central portion nearer to the front passenger seat.

5. A reinforcing structure for automotive vehicles according to claim 2,

wherein the part of said lower cross car beam nearer to the driver's seat and the part of said lower cross car beam nearer the front passenger seat are 10 symmetric with each other.

6. A reinforcing structure for automotive vehicles according to claim 1,

wherein said upper cross car beam has a plurality of curved parts.

15. 7. A reinforcing structure for automotive vehicles according to claim 1,

wherein the straight part of said L-shaped lower cross car beam is slightly curved.

20. 8. A reinforcing structure for automotive vehicles according to claim 1,

wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle or another 25 polygon.

9. A reinforcing structure for automotive vehicles according to claim 8,

wherein a reinforcing bridge is arranged in each of said hollow bars.

30. 10. A reinforcing structure for automotive vehicles according to claim 1,

wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have a selected one of the same 35 and different shapes, areas and thickness.

11. A reinforcing structure for automotive vehicles according to claim 1,

wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative positions including superposition and juxtaposition.

5 12. A reinforcing structure for automotive vehicles according to claim 1,

 wherein a steering shaft is mounted on said cross car beams in the direction crossing said cross car beams, and

10 wherein said steering shaft is arranged between said upper cross car beam and said lower cross car beam.

15 13. A reinforcing structure for automotive vehicles wherein a plurality of cross car beams arranged on the back of the instrument panel in the vehicle are supported by at least a brace erected on the vehicle floor,

20 wherein said cross car beams include an upper cross car beam of a hollow bar having a closed section suspended between left and right front pillars and a lower cross car beam of a hollow bar having a closed section bent in the shape of L, and

25 wherein the part of said lower cross car beam nearer to the driver's seat is arranged in spaced and substantially parallel relation with said upper cross car beam, and the remaining part of said lower cross car beam functions as said brace, and

 wherein said upper cross car beam and said lower cross car beam are coupled to each other by at least a stay.

30 14. A reinforcing structure for automotive vehicles according to claim 13,

 wherein an L-shaped lower cross car beam of a hollow bar having a closed section similar to the L-shaped lower cross car beam nearer to the driver's seat is arranged nearer to the front passenger seat,

 wherein a part of said lower cross car beam is arranged in spaced and substantially in parallel

relation with said upper cross car beam, and the other part of said lower cross car beam functions as said brace, and

5 wherein said upper cross car beam and said lower cross car beam are coupled to each other by at least a stay.

15. A reinforcing structure for automotive vehicles according to claim 13,

10 wherein a brace for supporting said upper cross car beam is arranged on the part of the central portion nearer to the front passenger seat.

16. A reinforcing structure for automotive vehicles according to claim 14,

15 wherein the part of said lower cross car beam nearer to the driver's seat and the part of said lower cross car beam nearer to the front passenger seat are symmetric with each other.

20 17. A reinforcing structure for automotive vehicles according to claim 13,

wherein said upper cross car beam has a plurality of curved parts.

18. A reinforcing structure for automotive vehicles according to claim 13,

25 wherein the straight part of said L-shaped lower cross car beam is slightly curved.

19. A reinforcing structure for automotive vehicles according to claim 13,

30 wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle or another polygon.

20. A reinforcing structure for automotive vehicles according to claim 19,

35 wherein a reinforcing bridge is arranged in each of said hollow bars.

21. A reinforcing structure for automotive vehicles

according to claim 13,

wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have selected one of the same and different shapes, areas and thickness.

5 22. A reinforcing structure for automotive vehicles according to claim 13,

wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative 10 positions including superposition and juxtaposition.

23. A reinforcing structure for automotive vehicles according to claim 13

wherein a steering shaft is mounted on said cross car beams in the direction crossing said cross 15 car beams, and

wherein said steering shaft is arranged between said upper cross car beam and said lower cross car beam.

24. A reinforcing structure for automotive vehicles

20 wherein a plurality of cross car beams arranged on the back of the instrument panel and suspended between left and right front pillars in the vehicle are supported by at least a brace erected on the vehicle floor,

25 wherein said cross car beams include an upper cross car beam of a hollow bar having a closed section suspended between the left and right front pillars and two lower cross car beams each of a hollow bar having a closed section bent in the shape of L,

30 wherein selected one of the lower cross car beam nearer to the driver's seat and the lower cross car beam nearer to the front passenger seat is partially in contact and welded with said upper cross car beam along the contact line, and

35 wherein a part of the other lower cross car beam nearer to the driver's seat or the front passenger seat, as the case may be, is arranged in spaced

and substantially parallel relation with said upper cross car beam, and said part of said other lower cross car beam and said upper cross car beam are coupled to each other by at least a stay.

5 25. A reinforcing structure for automotive vehicles according to claim 24,

 wherein said upper cross car beam has a plurality of curved portions.

10 26. A reinforcing structure for automotive vehicles according to claim 24,

 wherein the straight part of said L-shaped lower cross car beam is slightly curved.

15 27. A reinforcing structure for automotive vehicles according to claim 24,

 wherein the closed section of each hollow bar constituting said upper cross car beam and said lower cross car beam is in the shape of selected one of a circle, an ellipse, a square, a rectangle and other polygons.

20 28. A reinforcing structure for automotive vehicles according to claim 27,

 wherein a reinforcing bridge is arranged in said hollow bar.

25 29. A reinforcing structure for automotive vehicles according to claim 24,

 wherein the closed sections of the hollow bar of said upper cross car beam and the hollow bar of said lower cross car beam have selected one of the same and different shapes, areas and thickness.

30 30. A reinforcing structure for automotive vehicles according to claim 24,

 wherein said upper cross car beam and said lower cross car beam are arranged in arbitrary relative positions including superposition and juxtaposition.

35 31. A reinforcing structure for automotive vehicles according to claim 24,

 wherein a steering shaft is mounted on

said cross car beams in the direction crossing said cross car beams, and said steering shaft is arranged between said upper cross car beam and said lower cross car beam.